AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. (currently amended) A focal spot sensing device comprising:

a housing that resists x-ray beams;

an opening disposed in a wall of the housing that allows an x-ray beam to enter the housing; and

a sensor device disposed in the housing for interpreting a position of the x-ray beam for calculating a position of a focal spot, the sensor device being disposed in the housing such that an area of the x-ray allowed to fall on the sensor device changes in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device;

wherein the opening is sized such that the x-ray beam at a surface of the sensor device is less than a total sensitive area of the sensor device;

wherein the sensor device includes at least ~~two~~ three detector elements;

wherein a first and a second of the at least three detector elements are arranged next to each other and are aligned with a first axis parallel to the plane of the sensor device, and the first and a third of the at least three detector elements are arranged next to each other and are aligned with a second axis parallel to the plane of the sensor device, the second axis being perpendicular to the first axis;

[[, and]]wherein the opening and the at least [[two]] three detector elements are disposed[[,]] such that the x-ray beam passing through the opening is allowed to strike more than [[one]] two of the at least [[two]] three detector elements, but only on just a portion of each of the at least [[two]] three detector elements capable of receiving the x-ray beam, the portion being less than 100% of a sensitive area of an associated detector element;

wherein a change in output signal of each detector element of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on each detector element of the sensor device in response to the movement of the focal spot; and

wherein the change in output signal is a position indicator for the focal spot in two dimensions.

2-4. (canceled)

5. (previously presented) The device of claim 1, wherein the at least two detector elements include a scintillator and a photodiode.

6. (currently amended) The device of claim [[1]] 7, wherein the sensor device includes a fluorescent screen, which faces the opening so that the x-ray beam strikes the fluorescent screen, and a position sensitive photodiode that is arranged between the fluorescent screen and a back wall of the housing.

7. (currently amended) ~~The device of claim 6,~~ A focal spot sensing device comprising:

a housing that resists x-ray beams;

an opening disposed in a wall of the housing that allows an x-ray beam to enter the housing; and

a sensor device disposed in the housing for interpreting a position of the x-ray beam for calculating a position of a focal spot, the sensor device being disposed in the housing such that an area of the x-ray allowed to fall on the sensor device changes in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device;

wherein the opening is sized such that the x-ray beam at a surface of the sensor device is less than a total sensitive area of the sensor device;

wherein the sensor device includes at least one detector element, and wherein the opening and the at least one detector element are disposed such that the x-ray beam passing through the opening is allowed to strike only a portion of the at least one detector element capable of receiving the x-ray beam, the portion being less than 100% of a sensitive area of the at least one detector element;

wherein a change in output signal of the at least one detector element of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on the at least one detector element of the sensor device in response to the movement of the focal spot;

wherein the change in output signal is a position indicator for the focal spot; and

wherein the opening is dimensioned to be approximately a pinhole.

8. (original) The device of claim 6, wherein the fluorescent screen is optically coupled to the position sensitive photodiode.

9. (original) The device of claim 8, wherein the fluorescent screen is optically coupled to the position sensitive photodiode by a transparent epoxy layer.

10. (currently amended) The device of claim [[1]] 7, further comprising a control mechanism in electronic communication with the sensor device.

11. (original) The device of claim 10, wherein the control mechanism calculates the focal spot movement and compensates for detector response error induced by focal spot movement.

12. (currently amended) A focal spot sensing device comprising:

a housing that resists x-ray beams;

an opening disposed in the housing that allows an x-ray beam to enter the housing; [[and]]

a first means responsive to the x-ray beam allowed to enter the housing for calculating a position of a focal spot; and

a second means responsive to the x-ray beam allowed to enter the housing for further calculating the position of the focal spot;

wherein the opening is sized such that the x-ray beam at a surface of the first means for calculating and at a surface of the second means for calculating is less than a total sensitive area of the first means for calculating and the second means for calculating;

wherein an area of the x-ray is allowed to fall on the first means and the second means for calculating such that the area changes in both position and size at the first means and the second means for calculating in response to movement of the focal spot in a plane parallel to the plane of the first means and the second means for calculating;

wherein the first means for calculating is aligned with a first axis, the second means for calculating is aligned with a second axis, the first axis is perpendicular to the second axis, and the first and second axes define a plane parallel to the first means and the second means for calculating;

wherein the first means and the second means for calculating each include[[s]] at least two detector elements arranged next to each other and the opening is sized so that

the x-ray beam strikes more than one of the at least two detector elements of each means for calculating, but only a portion of each detector element, the portion being less than 100% of a sensitive area of an associated detector element;

wherein a change in output signal of each detector element of the first means and the second means for calculating is responsive to a change in position and size of the area of x-ray allowed to fall on each detector element of the first means and the second means for calculating in response to the movement of the focal spot; and

wherein the change in output signal is a position indicator for the focal spot in two dimensions.

13-15. (canceled)

16. (original) The device of claim 12, wherein the means for calculating includes a fluorescent screen, which faces the opening so that the x-ray beam strikes the fluorescent screen, and a position sensitive photodiode that is arranged between the fluorescent screen and a back wall of the housing; and the opening is dimensioned to be approximately a pinhole.

17. (original) The device of claim 16, wherein the fluorescent screen is optically coupled to the position sensitive photodiode by a transparent epoxy layer.

18. (original) The device of claim 12, further comprising a control mechanism in electronic communication with the means for calculating a position of a focal spot.

19. (original) The device of claim 18, wherein the control mechanism calculates the focal spot movement and compensates for detector response error induced by focal spot movement.

20. (currently amended) An imaging system comprising:

an x-ray source that produces an x-ray beam and has a focal spot;

a detector array that receives the x-ray beam and includes a focal spot sensing device disposed at only one edge of the detector array in place of a single detector element of the detector array, the focal spot sensing device includes: a housing that resists x-ray beams; an opening disposed in a wall of the housing that allows the x-ray beam to enter the housing; and a sensor device disposed in the housing that interprets a position of the x-ray beam for calculating a position of the focal spot, the sensor device being disposed in the housing such that an area of the x-ray allowed to fall on the sensor device changes in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device;

wherein the opening is sized such that the x-ray beam at a surface of the sensor device is less than a total sensitive area of the sensor device;

wherein the sensor device includes at least two detector elements arranged next to each other and the opening is sized so that the x-ray beam strikes more than one of the at least two detector elements, but only a portion of each, the portion being less than 100% of a sensitive area of an associated detector element;

wherein a change in output signal of each detector element of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on each detector element of the sensor device in response to the movement of the focal spot; and

wherein the change in output signal is a position indicator for the focal spot.

21-23. (canceled)

24. (currently amended) ~~The system of claim 20,~~ An imaging system comprising:

an x-ray source that produces an x-ray beam and has a focal spot;

a detector array that receives the x-ray beam and includes a focal spot sensing device, the focal spot sensing device includes: a housing that resists x-ray beams; an

opening disposed in a wall of the housing that allows the x-ray beam to enter the housing; and a sensor device disposed in the housing that interprets a position of the x-ray beam for calculating a position of the focal spot, the sensor device being disposed in the housing such that an area of the x-ray allowed to fall on the sensor device changes in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device;

wherein the opening is sized such that the x-ray beam at a surface of the sensor device is less than a total sensitive area of the sensor device;

wherein the sensor device includes at least one detector element and the opening is sized so that the x-ray beam strikes only a portion of the at least one detector element, the portion being less than 100% of a sensitive area of the at least one detector element;

wherein a change in output signal of the at least one detector element of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on the at least one detector element of the sensor device in response to the movement of the focal spot;

wherein the change in output signal is a position indicator for the focal spot;

wherein the sensor device includes a fluorescent screen, which faces the opening so that the x-ray beam strikes the fluorescent screen, and a position sensitive photodiode that is arranged between the fluorescent screen and a back wall of the housing; and

wherein the opening is dimensioned to be approximately a pinhole.

25. (previously presented) The system of claim 24, wherein the fluorescent screen is optically coupled to the position sensitive photodiode by a transparent epoxy layer.

26. (original) The system of claim 20, further comprising a control mechanism in electronic communication with the detector array and the x-ray source.

27. (currently amended) A method for sensing a focal spot, the method comprising:

receiving an x-ray beam into an opening of a focal spot sensing device, the focal spot sensing device having a sensor device;

receiving the x-ray beam at the sensor device disposed in the focal spot sensing device, wherein the sensor device includes at least ~~two~~ three detector elements arranged ~~next to each other~~ on two orthogonal axes such that the x-ray beam passing through the opening is allowed to strike more than ~~one~~ two of the at least ~~two~~ three detector elements, but only a portion of each, the portion being less than 100% of a sensitive area of an associated detector element;

measuring a change in output signal of each detector element in response to a change in position and size of the area of x-ray allowed to fall on each detector element in response to the movement of the focal spot;

interpreting a position of the x-ray beam; and

calculating a position in two dimensions of the focal spot in response to an area of the x-ray beam allowed to fall on the sensor device changing in both position and size at the sensor device in response to movement of the focal spot in a plane parallel to the plane of the sensor device;

wherein a change in output signal of the sensor device is responsive to a change in position and size of the area of x-ray allowed to fall on the sensor device in response to the movement of the focal spot; and

wherein the change in output signal is a position indicator for the focal spot in two dimensions.

28. (previously presented) The method of claim 27, further comprising calibrating a CT system detector in response to the position of a focal spot.

29. (canceled)

30. (previously presented) The method of claim 27, further comprising receiving the x-ray beam at the sensor device disposed in the focal spot sensing device, the sensor device includes a fluorescent screen, which faces the opening so that the x-ray beam strikes the fluorescent screen, and a position sensitive photodiode that is arranged between the fluorescent screen and a back wall of the focal spot sensing device.

31-32. (canceled)